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# BEEKEEPING FOR THE FRUIT-GROWER AND SMALL RANCHER, OR AMATEUR

By GEO. A. COLEMAN

Honey bees are necessary for the proper pollination of nearly all fruits and berries, some vegetables, and alfalfa and clover where grown for seed. For this purpose alone at least one colony of bees should be kept for every five acres of fruits, or for a smaller acreage



(Student Apiary on the Campus, University of California)

of berries and vegetables. They will increase the crop in the case of some varieties from ten to one hundred per cent, producing more perfect, therefore more salable, fruit. A few colonies of bees require less care than a cow or a dozen hens, and will produce annually from forty to one hundred pounds of surplus honey, which may be used as food, sold for cash or traded for other food.

## THE KIND OF BEES TO KEEP

There are four races of bees which are being successfully cultivated by beekeepers. Opinions differ as to the value of each. The principal characteristics of these races are as follows:

The native blacks (probably derived from the German black bees) are generally energetic, good honey gatherers and cap their comb

white; they are easily irritated and therefore hard to handle; they also readily succumb to bee diseases, the wax moth, or other enemies.

The Carniolans are gentle and good workers, but have a tendency to swarm; they cap the comb white and gather very little propolis or bee glue, which is a valuable trait in the production of comb honey; they are more resistant to diseases than the blacks.

The Caucasians are the gentlest of all the races, but swarm excessively in most localities where tried; their most disagreeable trait is that they stick the sections and frames up with propolis the worst of all races.

The Italian bees are generally very gentle, pleasant to handle, and good honey gatherers, their habit of placing the capping down close to the honey, making them more adapted to the production of extracted than of comb honey, although in a good flow of nectar some strains of Italians will produce as fine white comb honey as any one could wish. The most valuable trait is their energetic defense of the colony against all enemies, and their resistance to foul-brood diseases. Taking all things into consideration, it is believed the Italian bees will give the best satisfaction in most localities. Beekeepers are divided as to the best strains, some favoring the golden, some the 3-5-banded, and some the dark or so-called leather-colored Italians. The author's personal experience is that a good, vigorous queen of any one of them is all right, the golden probably being the gentlest and the queens easiest to find on account of their light color. but for energetic bees and returns in honey the leather-colored are ahead.

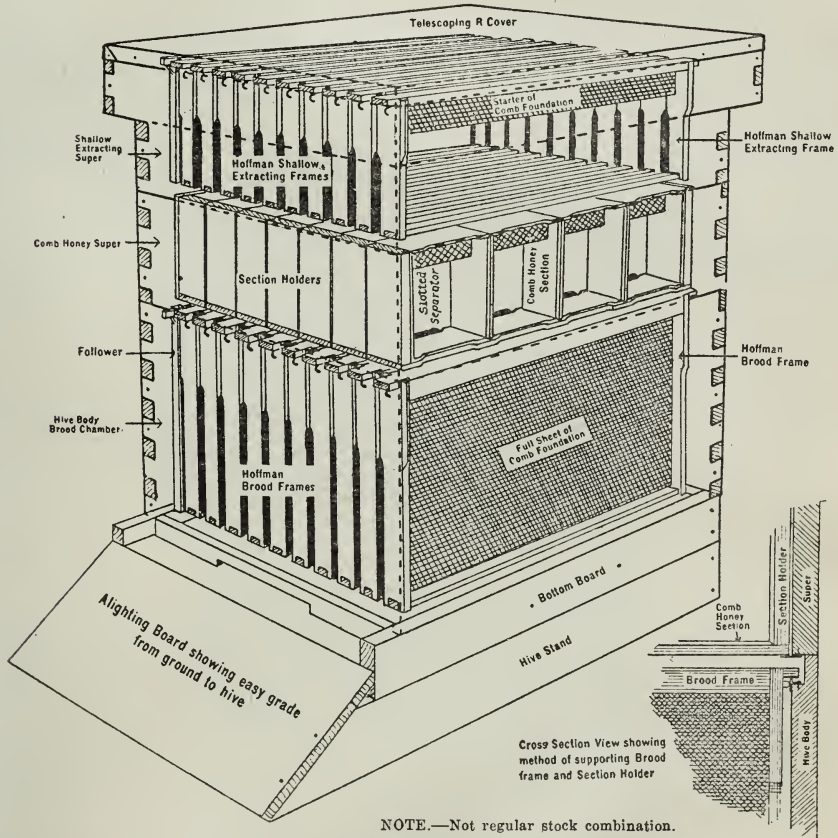
#### WHERE TO OBTAIN BEES TO BEGIN WITH

It is usually best for the beginner to purchase a few colonies of a neighbor or nearby beekeeper, and avoid moving them any great distance. If they are not just the kind desired, one can soon change their complexion by introducing Italian queens of the desired strain. If none are to be obtained in the neighborhood, they can be purchased of any reliable breeder advertising in the bee journals.

#### EQUIPMENT NECESSARY

*Hives.*—The standard hive is now the Langstroth, dove-tailed hive (see illustration), equipped with ten L-Hoffman frames, self-spacing, in the brood chamber, using full sheets of comb foundation, wired in. For extracted, or chunk honey, three to five shallow extracting supers equipped with frames and full sheets of foundation wired in if for extracting; or if only chunk honey is desired starters only may be used. For comb honey, one shallow extracting frame and three to

five comb honey supers for each colony should be provided. Beekeepers differ in their opinion as to the use of full sheets of foundation in the sections, as against starters. The author prefers a starter at both top and bottom of the section, the upper one a triangle, the lower a narrow strip. A little experimenting will determine which is best for a given locality.



Standard Langstroth, or Dove-tailed Hive (After Root)

Whatever type of hive and supers is selected, be sure that you have a supply on hand long before the flow of nectar is expected. Most beginners, and some experienced beekeepers, too, wait until the honey flow is on before ordering their supplies and then wonder why they don't get any honey. *Preparedness* is the secret of success in the honey business. Anticipate your needs and supply them in advance.



*Bee Smoker.*—A standard Root, or some other reliable bee smoker, is a necessity. (Illustration.)

*Bee Veil.*—The best is one made of black netting (cotton tulle), with either a silk or black wire facing in front of the eyes; made with a rubber band in the upper end to fit over the crown of any old straw hat, with ample skirts and a rubber band also at the lower end; a strong cord at either corner, tying snugly around the waist, long enough to reach around and tie in front, keeping the veil from creeping up around the neck, and the bees from crawling up under, which they will do if the least space is left open around the bottom. (Illustration.)



Bee Smoker (Standard Root)

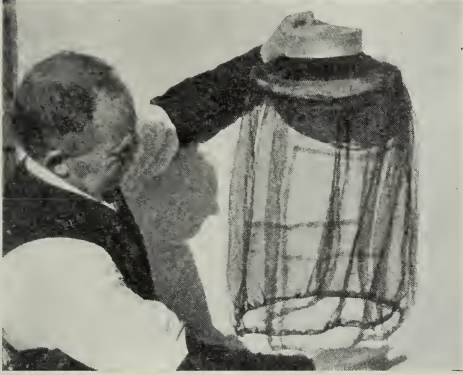
Hive tools are also a necessity. A good, strong, wide-bladed screwdriver will answer for one, but the special steel hive tool here illustrated is much better and will be found to be the most useful tool about the apiary; a broad-bladed glazier's knife will be found useful in scraping hive bodies, frames, etc. The other tools illustrated will all be needed, and are usually found in the equipment of any well regulated ranch. (Illustration.)

*Bee Gloves.*—Are provided for the timid, but will soon be discarded as too clumsy and hot, causing more stings than they prevent. Learn to handle the bees with your sleeves rolled up to the elbow, and you will receive very few stings.

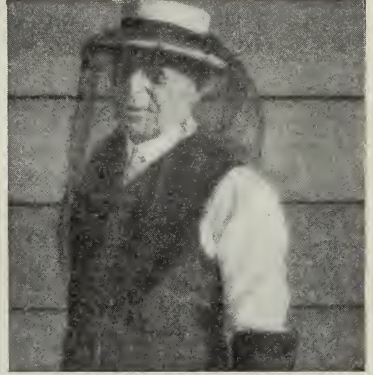
#### HOW TO HANDLE BEES

In the average-sized family, there will usually be found one person with good, steady nerves, who is a keen observer, a gentle mover, and a lover of live things. Let this one be the beekeeper.

In preparing to examine a colony of bees, first light up your smoker, using rotten oak wood, old burlap sacking, or oiled waste for fuel; something to make a good blue smoke, not a smudge, the object of smoke being to alarm the bees, causing them to fill themselves with



Bee Veil (to slip over any old straw hat)



Bee Veil (showing manner of adjusting)

honey, in which condition they are easily handled, but *not* to *suffocate* or *injure* them. Most beginners use too much smoke; a little now and then to quiet their nerves is all that is needed to control them.



Tools used in Apiary work

Put on the bee veil and tie down the pantaloon legs (ladies should wear bloomers or overalls) well around the ankle, or use bicycle clips.

With smoker and hive tool in hand, approach the hive from the windward and back, and preferably on the right side, *never* in front; give a few puffs of smoke at the entrance to settle the guards; with

the hive tool pry up the cover and super cover about one eighth of an inch, blow in a few puffs of smoke, wait a minute, then carefully remove the cover, placing it on the ground at the back of the hive; (after a little practice you will use it turned on edge as a seat) give a few puffs of smoke on the tops of the frames to drive the bees down and quiet them, and then hang the smoker on the front edge of the hive, where it will be handy if needed (you will find a hook on the back of the bellows for this purpose).

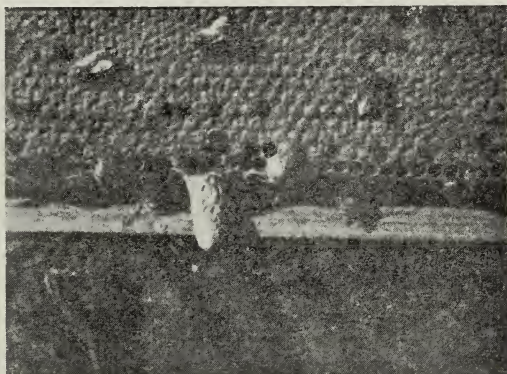
With your hive tool begin on the frame next to you and pry it loose at each end, as you will usually find it stuck fast with *propolis* if you find that abomination, a division board, stuck in between the hive wall and the frame, take it out and do not return it.

#### WHAT YOU WILL FIND IN THE HIVE AND WHAT TO DO WITH IT

The first frame you will take out you will find nicely drawn out. Remove it and place it against the back of the hive out of your and the bees' way, in order that you may have room to work with the other frames. Now *look out*, there are bees all over the next frame, and they have their stings ready for instant use, therefore handle carefully, and **don't drop it!** Get a good, firm grip with the thumb and forefinger on each end of the top bar, being careful not to crush a single bee; lift up the frame very slowly, never mind the bees, they will get out of the way; if you should happen to get a sting, **don't drop the comb: hold on to it**, and quietly remove the sting with a scraping motion of your thumb nail so as to get the sting out without squeezing the poison sac which would put more poison in the wound and make it hurt worse. Then go on with your work; the bees will sting you some more if you don't. You will find the bees gathered on the upper third of the comb sticking their heads into the honey cells and loading up on it; you need not fear their stinging while they are doing this. Just below the honey circle you will see a circle of cells filled with a brownish-yellow sticky-looking substance—"the bee bread," or food for the young larvae. Watch and you will see a worker bee with a mass of this *pollen*, for that is what it is, on the hind legs, which she will presently dump into one of these cells. Hold the frame up to the light, getting the sun right into the cells if you can. You will find some cells with white looking objects of various sizes—the *larvae*. In some cells you may find white objects standing on end in the bottom of the cell; these are the *eggs*, which will hatch into the larvae. In another cell you will find a tiny white larva curled up at the bottom in a mass of milky fluid—the "*Royal Jelly*"—upon



which *all* larvae are fed for the first three days, and which is a substance furnished by the young nurse bees from certain glands in the head in combination with stomach secretions. Other cells you will find capped over, which look very opaque—not transparent like capped-over honey cells. These contain the *pupal cases*, which have been spun by the larvae and in which they change to the *adult* bee with wings, legs and antennae. You may find one just sticking her head through, biting away the capping as she does so, her antennae slowly protruding, and then sticking her tongue out. Watch and you will see a young worker bee run to her assistance and perhaps offer her a little honey on her own tongue. Now look over the comb and you will see some young bees just emerged, their wings all crumpled up yet. It will take them about three days to get to work.



A completed queen cell

They will be *nurse* bees now for two weeks, feeding the larvae, polishing up cells and doing all of the work of the hive. They will then become *field* bees, gathering nectar and pollen and bringing it to the hive, a work at which they will continue until they drop dead on some return trip loaded down with honey; well-behaved and healthy bees never die in the hive.

In going over the frames, one after the other, methodically examining them and placing them back in the hive in the order taken out, you may suddenly come upon the *Queen* traveling leisurely over the comb, examining each cell carefully to see if the bees have properly prepared it for an egg; you may recognize her by her *long pointed abdomen*, which, if you are patient and quiet, you may see her insert into a cell and deposit an egg at the bottom, taking about half a minute for the whole operation. If it is during the spring, or breed-

ing season, you may run across one or more very large cells (see illustration) on the lower edge, or perhaps on the side, of some frame—a *queen cell*, from which a virgin queen will hatch if it is left alone; and when this happens the *bees will swarm*, the old queen going off with the swarm, leaving a young queen in the hive, so if you do not want them to swarm, or do not want increase, carefully remove these cells and destroy them once a week during the breeding season. If you do want increase, take out a frame with a perfect queen cell on it, allowing the bees to remain on it, and another frame filled with capped-over brood, also one filled with honey and “bee bread,” and put them in one side of the new hive, filling the balance of the hive with combs or frames with full sheets of foundation; place this hive on a new stand at some distance from the old hive and close the entrance so that only a few bees can get out at a time. **Do not do this** except in warm, settled weather or your new colony will starve or chill.

While you are at work you will probably be alarmed by a loud buzzing and several big, clumsy bees getting in your way continually. These are the *Drones* or male bees, their only function being to mate with and fertilize the queen. They do not work and the nurse bees are even compelled to feed them, since their tongues are cut short and they are unable to feed themselves; they are therefore a continual drain on the resources of the hive and the bees get rid of them as soon as possible after their function is performed, by taking them out of the hive and dropping them where they cannot get back.

In looking over the frames you will find here and there patches of brood comb with the cells considerably larger than the regular worker cells, the capping slightly raised, or perhaps some big head with pinkish eyes exposed. These are *drone cells* from which the drones will hatch. To prevent a lot of drones hatching cut out this drone comb, let the larva die, and save the comb for wax. Replace such combs with frames with full sheets of foundation wired in, which the bees will draw out into worker cells; *worker bees* are wanted for honey. If you find a hive filled with drones which you wish to get rid of, get an **Alley** drone trap from your dealer in supplies and place it over the entrance.

#### CLEANING UP THE HIVES AND FRAMES

In the first examination in the spring you will find the combs *all stuck* up with propolis, honey comb stuck on top of the frames, or in between the frames, between the frames and the walls of the hive, and some crosswise—if you have used only starters in the brood frames, or no foundation at all. The honey comb, or *burr-comb* as it is called, should all be removed with your hive tool, or scraper, a covered tin



can being provided to receive it as you take it out, keeping the can covered to prevent "robbers" from getting started. The propolis should be all scraped off and thrown away. Also clean all droppings from the bottom of the hive. The hive should be put into first-class shape for the spring honey flow and easy examination.

#### PREPARING FOR THE HONEY FLOW

Your supers should have all been prepared during the winter when other work is slack; sections and foundation all in, ready to put on the hive. Watch the bees and see when they have settled down to steady work, which you will be able to recognize by the way they come and go from the hive. Take a look at the hive once in a while and when you see the upper part of the brood frames filled with nice, white, capped-over honey, and the hive running over with bees put on your supers, the extracting super next to the brood frame as the bees will enter this more readily than the comb honey super. Examine the super once in a while; if the nectar is plentiful you will soon see them in the first one. Now if you are working for the finest white comb honey, watch when this honey appears in the extracting super and replace it with a comb-honey super, placing the extracting super on top of all the comb-honey supers. When the first comb-honey super is about two-thirds filled with capped sections, raise it up and put an empty comb-honey super under it next the brood chamber. Do this until the honey flow from which you wish to get the comb honey is about over, or the sections are all filled; then place your extracting super next the brood frame and save it to feed the bees during the winter or to build them up on in the spring.

#### BEEKEEPER'S LIBRARY

There is already a large literature on bee keeping, all interesting reading and more or less practical. From this literature a few publications may be selected which are really helpful, and some of them vital and necessary to him who would make it a business and therefore wishes to be well informed on the subject.

The following is a selected list of publications which should be in the hands of all progressive beekeepers:

The University of California offers a Correspondence Course in Beekeeping consisting of fifteen lessons, application for which may be made to the Division of Agricultural Education.

## BULLETINS FOR FREE DISTRIBUTION

University of California Bulletin 274, The Common Honey Bee as an Agent in Prune Pollination.

(The following to be obtained by addressing the Division of Publications, U. S. Dept. of Agriculture, Washington, D. C.):

Farmers' Bulletin No. 442, Treatment of Bee Diseases.

Farmers' Bulletin No. 447, Bees.

Farmers' Bulletin No. 503, Comb Honey.

Farmers' Bulletin No. 695, Outdoor Wintering of Bees.

Farmers' Bulletin No. 653, Honey and its Uses in the Home.

## BULLETINS FOR SALE BY THE SUPERINTENDENT OF DOCUMENTS

The following publications can no longer be obtained from the Department of Agriculture, but may be secured from the Superintendent of Documents at Washington at the prices indicated. Remittances should be made to the Superintendent of Documents, Government Printing Office, Washington, D. C., by postal money order, express order or New York draft. If currency is sent, it will be at sender's risk. Postage stamps, defaced or worn coins, foreign coins and uncertified checks will not be accepted.

Ent. Bul. No. 55, Rearing of Queen Bees .....	5 cents
Ent. Bul. No. 70, Report of Meeting of Inspectors of Apiaries, San Antonio, Texas, Nov. 12, 1906 .....	15 cents
Ent. Bul. No. 75, Part I, Production and Care of Extracted Honey ...	5 cents
Ent. Bul. No. 75, Part II, Wax Moths and American Foul Brood .....	5 cents
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Ent. Bul. No. 75, Part IV, Relation of Etiology (Cause) of Bee Diseases to Treatment .....	5 cents
Ent. Bul. No. 75, Part V, Brief Survey of Hawaiian Bee Keeping .....	15 cents
Ent. Bul. No. 75, Part VI, Status of Apiculture in United States .....	5 cents
Ent. Bul. No. 75, Part VII, Bee Keeping in Massachusetts .....	5 cents
Ent. Bul. No. 75, Parts I-VII, complete with Contents and Index .....	30 cents
Ent. Bul. No. 98, Historical Notes on Causes of Bee Diseases .....	10 cents
Ent. Bul. No. 121, Behavior of Honey Bee in Pollen Collecting .....	5 cents
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Dept. Bul. No. 325, Honeybees: Wintering, Yields, Imports and Exports of Honey .....	5 cents
Dept. Bul. No. 431, Sacbrood .....	10 cents
Dept. Bul. No. 489, Survey of Beekeeping in North Carolina .....	5 cents

Journal of Agricultural Research, Vol. VIII, No. 11, Spore-Forming Bacteria of the Apiary .....	15 cents
Chem. Bul. No. 154, Chemical Analysis and Composition of Imported Honey from Cuba, Mexico and Haiti .....	5 cents
Hawaii Agr. Exp. Sta. Bul. No. 17, Hawaiian Honeyeys .....	5 cents
Porto Rico Agr. Exp. Sta. Bul. No. 15, Porto Rican Beekeeping .....	5 cents

#### BEE JOURNALS PUBLISHED IN THE UNITED STATES

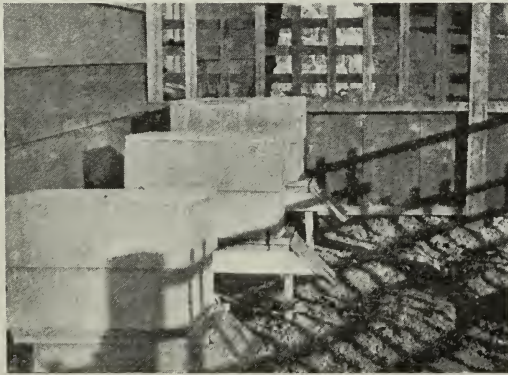
The Western Honey Bee, Covina, Cal. Price \$1.00 per year.  
 American Bee Journal, Hamilton, Ill., Price \$1.00 per year.  
 Gleanings in Bee Culture, Medina, Ohio, Price \$1.00 per year.  
 Domestic Beekeeper, Northstar, Mich.  
 Beekeepers' Item, New Branfels, Texas.

#### BOOKS RECOMMENDED TO BEEKEEPERS

*ABC and XYZ of Bee Culture*, A. I. and E. R. Root, Price \$2.50  
*Beekeeping*, E. F. Philips, Price \$2.00.  
*Productive Beekeeping*, F. C. Pellett, Price \$1.50.  
 Langstroth on the Hive and Honey Bee, revised by C. P. Dadant.  
 Fifty Years Among the Bees, C. C. Miller.  
 Advanced Bee Culture, W. Z. Hutchinson.  
 First Lessons in Beekeeping, C. P. Dadant.

*For Inspection of Apiaries.*—Apply to your County Inspector or County Farm Advisor.

*Supplies for Beekeepers.*—Manufacturers or agents of beekeepers' supplies are located in all parts of the United States. The 10-frame Langstroth hive is recommended above all others. It is not patented and may be had from all dealers.



A Back Yard Apiary Producing a Hundred Pounds, or Over, of Surplus Honey Every Year



## REPORTS

1897. Resistant Vines, their Selection, Adaptation, and Grafting. Appendix to Viticultural Report for 1896.  
 1902. Report of the Agricultural Experiment Station for 1898-1901.  
 1903. Report of the Agricultural Experiment Station for 1901-03.  
 1904. Twenty-second Report of the Agricultural Experiment Station for 1903-04.  
 1914. Report of the College of Agriculture and the Agricultural Experiment Station, July, 1913-June, 1914.  
 1915. Report of the College of Agriculture and the Agricultural Experiment Station, July, 1914-June, 1915.  
 1916. Report of the College of Agriculture and the Agricultural Experiment Station, July, 1915-June, 1916.

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